SUPERFUND PROJECT UPDATE

SOUTH CAVALCADE STREET SITE
HOUSTON, TEXAS

Proposed Plan of Action — *August 1988*

EPA ANNOUNCES THE PROPOSED PLAN OF ACTION FOR THE SOUTH CAVALCADE STREET HOUSTON SITE

This Proposed Plan provides a brief history of the South Cavalcade Street **Superfund*** site in Houston, Texas, describes the alternatives being considered to control contaminated soils and **groundwater** at the site, presents the rationale for identifying the preferred alternative for **remediation**, and outlines the public's role in helping the U.S. Environmental Protection Agency (EPA) make a final decision on a remedy. The alternatives summarized in this fact sheet are described in the **Remedial Investigation and Feasibility Study (RI/FS)** reports, which should be consulted for a more in-depth description of all alternatives.

Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly referred to as **Superfund**, requires publication of a notice and brief analysis of a Proposed Plan for site remediation.

*Words in bold are defined in this fact sheet's glossary.

SITE BACKGROUND

The South Cavalcade site is located within the city limits of Houston, Texas, approximately one and a half miles east of the intersection of Interstate 45 and Cavalcade Street (Figure 1). The 69 acre site is an abandoned wood treating facility. In 1910, the National Lumber and Creosoting Company began operating a wood treatment facility at this site. The National Lumber and Creosoting Company operated the facility until 1938. Koppers Company acquired the property and operated a wood-treating facility and coal tar distillation facility on the site until 1962. The site is currently used by three trucking firms for warehouse and terminal operations (Figure 2).

In 1983, the Houston Metropolitan Transit Authority investigated the site for mass transit use and found evidence of buried creosote. The Texas Department of Water Resources (now the Texas Water Commission) conducted a further study and determined that the site may pose a threat to public health or the environment.

In October 1984, the South Cavalcade site was proposed to the **National Priorities List (NPL)** for hazardous waste sites, and EPA began an extensive site study. This study, called a Remedial Investigation and Feasibility Study, identified site problems and evaluated possible cleanup methods.

THE REMEDIAL INVESTIGATION

The Remedial Investigation was conducted from November 1985 through November 1987. This investigation characterized the types, amounts, and location of contaminants at the site. The Remedial Investigation found contamination in soils, groundwater, and ditch sediments.

Analyses of soil samples on the site identified **heavy metals** and **polynuclear aromatic hydrocarbons (PAHs)** as potential contaminants of concern. The same contaminants were found in the groundwater samples taken from the two upper **aquifers**. PAHs were also found in drainage ditch sediments, but appeared to be related to the trucking activity presently on the site.

The Risk Assessment in the Remedial Investigation cited three pathways of potential exposure to the contaminants: 1) direct contact to the skin through contaminated soils and sediments, 2) ingestion of contaminated soils, surface waters, and groundwater, and 3) inhalation of contaminated dust. Alternatives were developed in the Feasibility Study to eliminate or prevent the threat of exposure to the contaminants.

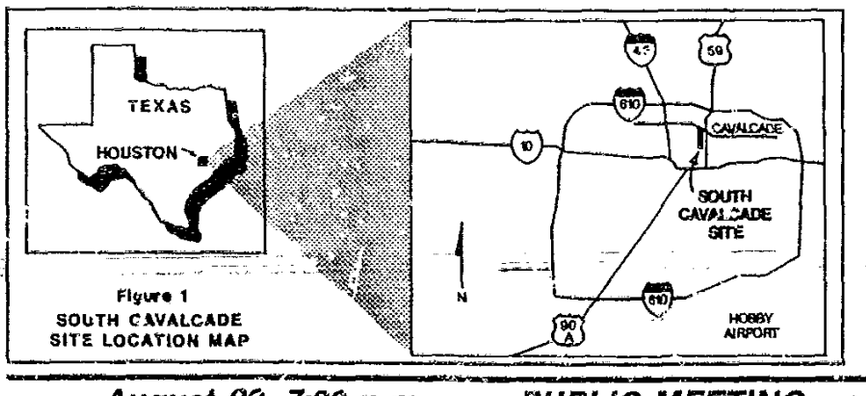

Figure 1
SOUTH CAVALCADE SITE LOCATION MAP

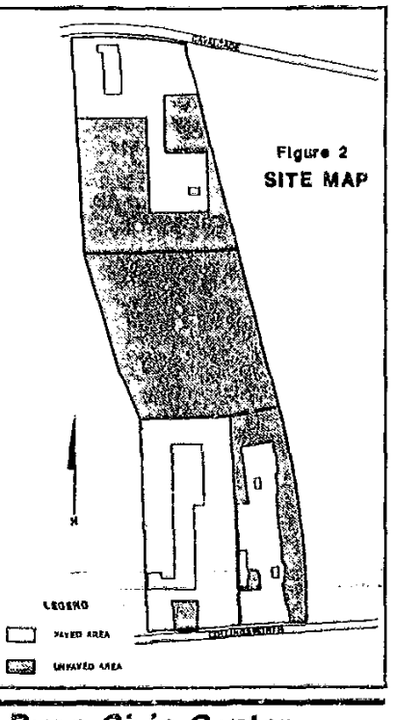

Figure 2
SITE MAP

August 29, 7:00 p.m. • PUBLIC MEETING • Ryan Civic Center

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THE FEASIBILITY STUDY

The Feasibility Study was completed in July 1988. It describes several options for soil remediation and groundwater remediation. All of the alternatives passed an initial screening as being technically feasible and otherwise appropriate for use at the South Cavalcade site.

All alternatives include long-term monitoring for soils now under reinforced concrete and buildings on the site, and air monitoring of the site during remediation.

Alternative 1 — No Action Alternative

Superfund requires that this alternative be considered only to serve as a baseline for comparing other remedial alternatives.

If the No Action alternative was implemented, the contaminants would remain on the site and the risks of exposure to site commercial occupants and visitors would remain. Costs associated with this remedy cover future soil and groundwater monitoring for 30 years. Property deeds would be changed to note the presence of hazardous substances.

Cost: $384,000

Time to Implement: 30 years

SOIL REMEDIATION

Alternative 2 — Stabilization with Cap over Soil

This alternative involves mixing soils with a chemical to prevent contaminants from leaching, and constructing and maintaining a reinforced concrete cap at the site over the areas of surface and surficial contamination. The objective of the cap is to eliminate the potential for direct physical contact with surface soils containing contamination. The cap and stabilization will also prevent further groundwater contamination. Property deeds would also be changed to note the presence of hazardous substances.

Cost: $4,100,000

Time to implement: 1 year

Alternative 3 — Offsite Disposal of Soil

Contaminated soil would be excavated to a depth of approximately 6 feet, transported to an existing hazardous waste land disposal site, and disposed there.

Cost: $3,200,000

Time to Implement: 1 year

Remediation Alternative 4 — Soil Washing

Soil washing is a mechanical separation procedure for washing contaminants from the soil (Figure 3). Contaminated soil would be excavated, and taken to the central part of the site to be washed in a large tank constructed there. The washed soil would be placed back in the excavation. The contaminated water would be piped to the groundwater treatment system for treatment prior to discharge.

Cost: $1,200,000

Time to Implement: 2 years

Alternative 5 — Onsite Incineration of Soil

This alternative would require an incinerator to be transported to or built in the central part of the site. Contaminated soil would be excavated and transported to the incinerator to be burned. The resulting ash, if shown to be non-hazardous by stringent testing, would be placed back in the excavation and covered by a concrete cap. If the ash is found to be hazardous, it would be transported to an approved disposal area and the cost would be greater. After completion, the incinerator would be removed form the site.

Cost: $2,900,000

Time to Implement: 2 years

Alternative 6 — In-Situ Bioreclamation

Bioreclamation is a natural process where soil bacteria are encouraged to rapidly destroy soil contaminants. Nutrients (fertilizer) and oxygen are added to the soil to enable bacteria to destroy contaminants. The contaminants are destroyed in the soils without needing to excavate the soils.

Cost: $115,000

Time to implement: 5 to 10 years

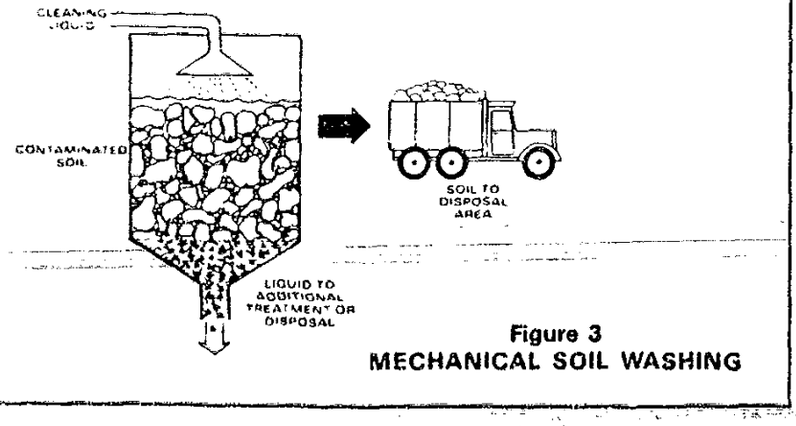

Figure 3
MECHANICAL SOIL WASHING

Alternative 7 — In-Situ Soil Flushing

Soil flushing washes contaminants from the soil (Figure 4. See back page.) The soil would be specially treated so that contaminants would release easily from the soil. The contaminants would then leach into the groundwater which would be collected and treated.

Cost: $115,000

Time to Implement: 5 to 10 years

Alternative 8 — Offsite Incineration

This alternative is similar to Alternative 5 except that the contaminated soil would be taken to an existing hazardous waste incinerator located away from the site.

Cost: $19,100,000

Time to Implement: 6 years

GROUNDWATER REMEDIATION

Alternative 9 — In-Situ Biological Treatment of Groundwater

Groundwater from the two upper aquifers below the site will be pumped up to a water treatment unit constructed in the central part of the site. Visible creosote will be removed. Nutrients and oxygen will be added to the water which will then be pumped back into the aquifers: this will allow natural bacteria to degrade the contaminants. Any excess water will be discharged to a City of Houston wastewater treatment facility.

Cost: $5,800,000

Time to Implement: 30 years

Alternative 10 — Carbon Adsorption and Filtration of Groundwater

Groundwater from the two upper aquifers below the site will be pumped up to a water treatment unit constructed in the central part on the site. Groundwater will flow through oil/water separation, carbon adsorption and filtration units to remove organic and metal contaminants (Figure 5). The treated water will be pumped back into aquifers, if possible; any excess treated water will be discharged into the drainage ditch on the east site of the site.

Cost: $7,600,000

Time to Implement: 30 years

Alternative 11 — Carbon Adsorption, Air Stripping, and Filtration of Groundwater

This alternative is similar to Alternative 10 for pumping and discharge of groundwater; the difference is the treatment method. Groundwater will flow through an oil/water separation, carbon adsorption, air stripping, and filtration units to remove organic and metal contaminants.

Cost: $7,800,000

Time to Implement: 30 years

Alternative 12 — Aerated Tank Treatment of Groundwater

This alternative is similar to Alternative 10 for pumping and discharge of groundwater; the difference is the treatment method. Groundwater will flow through an oil/water separation and aeration tank where the contaminants will be destroyed by bacteria.

Cost: $8,100,000

Time to Implement: 30 years

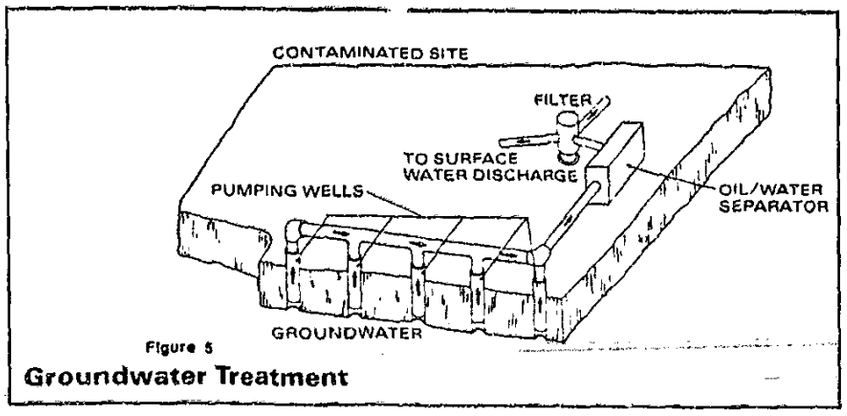

Figure 5
Groundwater Treatment

EPA'S PREFERRED ALTERNATIVES

The preferred alternatives for the South Cavalcade site are In-Situ Soil Flushing and Soil Washing for soils, and Carbon Adsorption with Filtration for groundwater (Alternatives 7, 4, and 10). Based on current information, these alternatives provide the best balance among the criteria the EPA uses to evaluate alternatives (see Box). EPA is proposing two alternatives for soils because groundwater problems in the southeast corner of the site prevent use of in-situ soil alternatives. EPA also recognizes that soils in the southeast corner may need to be covered with concrete after remediation due to onsite trucking activities.

In addition, if a PRP can demonstrate that in-situ biological treatment of groundwater (Alternative 9) can also be effectively used, EPA will consider that alternative.

EVALUATION OF ALTERNATIVES

This section provides an analysis of the remedial alternatives under consideration except for the No Action alternative. No Action does not meet any of the criteria except implementability and cost.

Overall Protection — All of the alternatives provide adequate protection of human health and the environment by eliminating or preventing risk of exposure through treatment, removal, or capping the contaminants.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) — All alternatives can be built to meet all present ARARs of federal and state environmental laws. However, if anticipated federal regulations for disposal of Superfund soils are passed in Fall 1988, Alternative 3 would not meet this ARAR and Alternative 5 may not.

Long-term Effectiveness and Permanence — All soil alternatives will leave the contaminants presently under the concrete onsite and will, therefore, require long-term monitoring. In addition, Alternative 2 will reduce long-term risks only if the integrity of the cap is maintained and the stabilization agent does not degrade. Alternatives 4 through 12 would reduce the long-term risks of exposure by destroying the contamination. Alternative 3 would reduce the long-term risks at the South Cavalcade site by removal of contaminants but would increase the risks at the offsite disposal site.

Reduction of Toxicity, Mobility, or Volume of Contaminants —Alternative 2 reduces mobility only. Alternatives 4 through 12 would reduce toxicity, mobility, and volume of wastes by destroying the contaminants. Alternative 3 reduces mobility, but not toxicity, and may increase the volume if fly ash were added to ease the handling of the soil.

Short-term Effectiveness — Alternatives 2, 3, 4, and 5 can be implemented in approximately one year. Alternatives 3, 4, 5, and 8 require excavation of the contaminated soil and may increase immediate risk of exposure during excavation. Alternative 3 involves offsite disposal of the soils: Superfund requires that offsite disposal be the least favored when onsite treatment is available. The groundwater alternatives (9 through 12) may take up to 30 years for completion.

Implementability — Alternatives 2, 6, and 7 will require extensive testing to prove they will be effective at this site. Alternatives 5 and 8 will require additional time to prove that incineration ash can be safely disposed.

Cost — Costs are similar for all alternatives except onsite incineration which costs somewhat more than other alternatives and offsite incineration which costs much more.

Community Acceptance — Concern of citizens is an important consideration when evaluating the remedial alternatives. EPA encourages area citizens to attend the public meeting described in the "Opportunity for Public Comment" part of this fact sheet. Community acceptance of the preferred alternative will be evaluated after the public comment period and will be described in the **Record of Decision** for the site.

GLOSSARY OF EVALUATION CRITERIA

Overall protection of human health and the environment addresses whether or not a remedy provides adequate protection and describes how risks are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

Compliance with ARARs addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of other federal or state environmental statutes.

Long-term effectiveness and permanence refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once remedial goals have been met.

Reduction of toxicity, mobility, or volume are criteria for rating the anticipated performance of the treatment technologies a remedy may employ.

Short-term effectiveness describes any adverse impacts on human health and the environment that may be posed during the construction and implementation period prior to remedial goals being fully achieved.

Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

Cost includes capital and operation and maintenance costs.

Community acceptance will be assessed in the Record of Decision following a review of public comments received on the RI/FS Report and the Proposed Plan.

OPPORTUNITY FOR PUBLIC COMMENT

The Superfund law emphasizes the importance of public involvement. A final decision on the remedy cannot be made until interested members of the community have had an opportunity to review and comment on the alternatives and the proposed plan.

The public is invited to comment on the remedial alternatives described in the Feasibility Study during a public comment period which will begin August 22, 1988 and will end September 19, 1988. During the public comment period, written comments may be submitted to:

Ms. Ellen Greeney
Community Relations Coordinator
U.S. EPA (6H-SS)
1445 Ross Avenue
Dallas, Texas 75202

The public is invited to attend a public meeting scheduled during the public comment period. At the meeting, EPA will provide information about the site and will answer questions from the public. Comments received and questions asked will provide the EPA with information about citizens' concerns about the South Cavalcade site. The public meeting will be held Monday, August 29, at 7:00 p.m. at:

Ryan Civic Center
4503 Elysian
Houston, Texas

If special arrangements are needed because of physical limitations, hearing or visual impairments, please contact Ellen Greeney at 214.655-6720 prior to August 22, 1968. Every effort will be made to ensure that all citizens have an opportunity to participate in this decision-making process.

Although this fact sheet summarizes the remedial alternatives proposed for the South Cavalcade site, interested persons are encouraged to visit the local information repositories and read the Remedial Investigation and Feasibility Study report in its entirety. The Administrative Record file which contains all the information EPA has considered to date for the site is located at the Houston Central Library; the public may comment on the Record. Locations of the information repositories are as follows.

Ryan Civic Association
The "I Can" Center
4503 Elysian
Houston, Texas

City Secretary's Office
910 Bagby
Houston, Texas

Houston Central Library
Texas & Local History Dept.
500 McKinney
Houston, Texas

Houston-Galveston Area Council
3555 Timmons, Suite 500
Houston, Texas

Department of Health
Environmental Control Division
7411 Park Place
Houston, Texas

Texas Water Commission
Stephen F. Austin Bldg.
1700 North Congress
Austin, Texas

If you have further questions, please call or write to:

Ms. Ellen Greeney,
Community Relations Coordinator
Superfund Programs (6H-SS)
U.S. EPA Region VI
1445 Ross Avenue
Dallas, TX 75202
214 655-6720

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GLOSSARY

Aquifer — A layer of rock or soil below the ground surface that can supply useable quantities of groundwater to wells and springs.

Creosote — Coal tar used a wood preservative to prevent rot.

Groundwater — Water found beneath the Earth's surface that fills pores between soil, sand, and gravel particles to the point of saturation. Groundwater often flows more slowly than surface water. When it occurs in a sufficient quantity, groundwater can be used as a water supply.

Heavy metals — A group of metals including lead, chromium, cadmium, and cobalt. These can be highly toxic at relatively low concentrations.

National Priorities List (NPL) — EPA's list of the top priority hazardous waste sites in the United States that are eligible for federal money under Superfund.

Polynuclear aromatic hydrocarbons (PAHs) — A highly reactive group of natural organic compounds, some of which are known carcinogens.

PRP — Potentially Responsible Party — Any person or companies (such as owners, operators, transporters, or generators) potentially responsible for, or contributing to, contamination problems at a Superfund site.

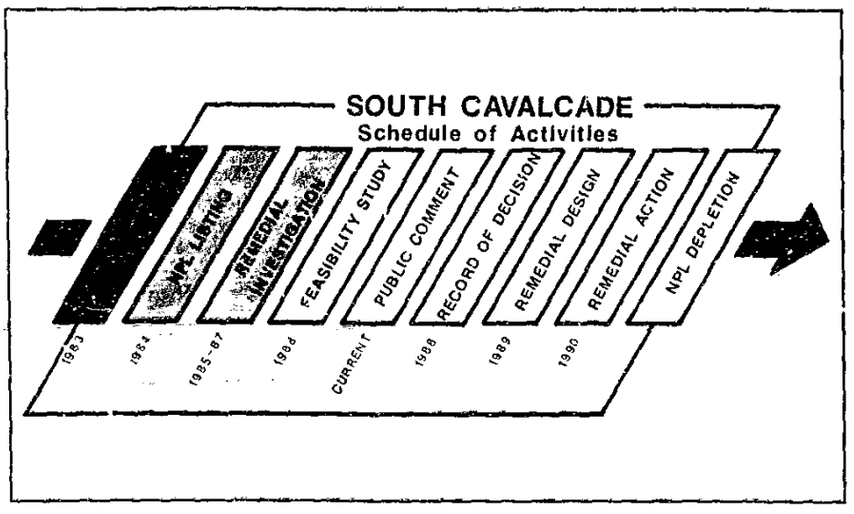
Remediation/remediate — Response action that stops or substantially reduces a release or threat of release of hazardous substances which is a serious, but not immediate, threat to public health.

Remedial Investigation and Feasibility Study (RI/FS) — A Remedial Investigation examines the nature and extent of contamination problems at a site. The Feasibility Study evaluates different remedial alternatives for site remediation and recommends the most cost effective and technically feasible alternative.

Record of Decision — A document issued after the Remedial Investigation and Feasibility Study that sets forth the selected remedy for a site.

Superfund — Also known as CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act). This law authorizes the federal government to respond directly to releases (or threatened releases) of hazardous substances that may endanger public health, welfare, or the environment. The U.S. EPA is responsible for managing the Superfund program.

U.S. EPA'S SUPERFUND PROCESS



In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), more commonly known as Superfund. This act authorizes EPA to respond to releases or threatened releases of hazardous substances that may endanger public health, welfare, or the environment. The 1980 law set up a $1.6 billion fund to pay for the investigation and remediation of sites where parties responsible for the problems are unable or unwilling to assume the responsibility for the Remedial Action. In October 1986, Congress amended and reauthorized the Superfund law, increasing the size of the fund to about $8.5 billion.

The figure above provides a brief explanation of how a Superfund response works at sites like the South Cavalcade site. The steps are described below.

After a site is discovered, it is inspected, usually by the state, which then ranks the site, using a system that takes into account:

- Possible health risks to the human population.
- Potential hazards (e.g., from direct contact, inhalation, fire, or explosion) created by substances at the site.
- Potential for the substances at the site to contaminate air or drinking water supplies.
- Potential for substances at the site to pollute or harm the environment.

If the site's problems are serious enough, it will be listed on the National Priorities List (NPL). Sites on the NPL are eligible for federal Superfund money.

Next, a Remedial Investigation (RI) is conducted. The RI assesses the type of contaminants present, identifies the degree of contamination, and characterizes potential risks to the community. Following the RI, a Feasibility Study (FS) is performed to examine the feasibility of various remedial alternatives. Upon completion of the FS, a Proposed Plan is presented to the public and a public comment period is conducted. A Record of Decision is written specifying the chosen alternative and a Remedial Design is then developed. Once these planning activities are finished, the chosen alternative is implemented.

Ongoing activities during the Superfund process include:

- Regular Monitoring. The site is monitored during remedial activities. If a site becomes an imminent threat to public health or the environment during the RI/FS, EPA may conduct an emergency action, known as a removal.
- Community Relations. Throughout the Superfund process, area citizens and local officials are informed about site activities and provided with opportunities to participate in decisions made about the site. Public comment periods are held at certain key points in the process to provide EPA and the state with information about citizens' questions and concerns.
- Search for Potentially Responsible Parties (PRPs). Having initially listed a site on the NPL, EPA undertakes a thorough investigation to identify parties who may be responsible for the waste contamination problem. The search for PRPs can and frequently does continue throughout the RI/FS process. Once identified, these parties are asked to participate in the site remediation activities. If they refuse, EPA may take legal action against them.

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MAILING LIST

If you wish to be placed on the UNC site mailing list, please complete this form, detach, and mail to: Ms. Ellen Greeney, Community Relations Coordinator, U.S. EPA (6H-SS), 1445 Ross Avenue, Dallas, TX 75202.

Name _____

Affiliation (if any) _____

Address _____

City _____ State _____ Zip _____

Daytime Phone (please include area code) _____

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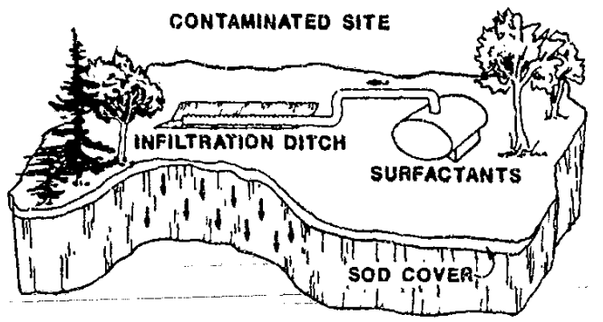

FIGURE 4
In-situ Soil Flushing

U.S. EPA — Region VI
Superfund Branch 6H-SS
1445 Ross Avenue Dallas, Texas 75202